

IN THE DRAWINGS

Applicants acknowledge that the drawings have been accepted as filed on July 7, 2003.

REMARKS

Claims 1-50 remain pending in the present application. Claims 1-18, 20-23, and 25-50 are rejected. Claims 19 and 24 are objected to.

The Examiner rejected claims 1-15, 26-40, 44-50 under 35 U.S.C. 101 as directed to non-statutory subject matter. Applicants respectfully traverse this rejection.

The Examiner cited that claims 1-15, 38-40 and 44-50 are directed to a judicial exception and such are pursuant to the guidelines of Patent Eligible Subject Matter MPEP 2106, requiring the claim to either have physical transformation and/or useful concrete or tangible result. The Examiner asserts that the claims fail to include transformation from one physical state to another and that there does not appear to be any tangible result claim. Applicants respectfully disagree.

Applicants respectfully direct the Examiner's attention to the claims, which call for performing a dynamic metrology routing adjustment process. The routing adjustment process includes correlating tool state analysis to a batch of work pieces and adjusting metrology routing based upon the correlation. The adjustment of a metrology routing is, indeed, a tangible result. For example, the process in claim 1 calls for performing tool state analysis upon a processing tool that performed a process step upon a batch of workpieces and correlating the tool state analysis to the batch of work pieces to perform an adjustment. This is, indeed, a tangible result. The tangible result called for by claim 1, for example, includes adjusting the metrology routing based upon the correlation describe above. The adjustment of the metrology routing, indeed, results in a change to a process operation that is performed, for example.

Further, a physical transformation, indeed, occurs since adjusting a metrology routing calls for changing the previous routing. Therefore, a physical transformation occurs when the metrology routing is adjusted. Further, the adjustment of data relating to metrology routing would result in a change relating to where workpieces are sent for metrology analysis, for example. Therefore, the claims, indeed, call for a physical transformation. Further, the claims call for useful, concrete and tangible result, which includes adjusting the metrology routing. Similarly, all claims call for performing a dynamic metrology routing adjustment that includes the adjustment of metrology routing in one form or another, which as described above, indeed involves physical transformation, as well as a tangible result.

The Examiner does not argue why he believes that concrete, tangible or useful results do not exist and no step of outputting a final result allegedly exists. 35 U.S.C. 101 recites that patentable subject matter includes useful process, machine, manufacture or composition, or any new and useful method of improvement thereof. Claims of the present invention call for various novel, non-obvious processes, apparatuses, and/or systems. For example, claim 1 calls for performing a process step on a batch of workpieces and performing a tool state analysis on the processing tool used to perform the process. Claim 1 also calls for performing a dynamic routing adjustment process that includes correlating the tool state analysis to the batch of workpieces and adjusting metrology routing based upon the correlation. These are specific, novel process steps that are patentable. A definite result and useful output is provided by the process described above. For example, the correlation of the tool state analysis with the batch of workpieces is used to adjust a metrology routing based upon the correlation, which is a clear, useful result of the method. Therefore, the Examiner has erred in rejecting the claims.

Further, PTO guidelines call for determining whether the claim indicates that it is directed to a practical application and the focus should be on the final result being achieved by the claimed invention as useful, tangible and concrete, and not on whether the steps taken to achieve a particular result are useful, tangible and concrete. *See* Section IV part (C)1(b) of the New Guidelines for 35 U.S.C. §101 of the Official Gazette Notice. Therefore, the focus should be whether the final result achieved by the claimed invention is useful, tangible and concrete. Clearly, the result of adjusting a metrology routing based upon the correlation of tool state analysis to a particular batch of workpieces is clearly a useful, tangible and concrete result. In fact, this result may be used, for example, to route certain workpieces for metrology analysis, which is clearly a useful, tangible and concrete step in a manufacturing environment. Therefore, in concert with the requirements of the guidelines provided in the Official Gazette, the methods described in claim 1 clearly meet the useful, tangible and concrete final result by the steps recited in the claim. Therefore, claim 1 of the present invention is statutory subject matter under 35 U.S.C. 101.

Similarly, claim 13 calls for adjusting the metrology routing based on the batches of workpieces, based on the correlation, which for at least the reasons described above, also provides a useful, tangible and concrete result. Further, claim 16 calls for means for performing a dynamic metrology routing adjustment process that includes adjusting metrology routing based upon correlating the tool state analysis to a batch of workpieces, which for at least the reasons described above, clearly provides a useful, tangible and concrete result. Further, independent claims 17 and 22 each call for a process controller that is capable of correlating tool state analysis to a batch of workpieces and adjusting the metrology routing based upon the correlation,

which for at least the reasons cited above, provides a useful, tangible and concrete final result. Further, claim 26 calls for a computer readable program storage device that is capable of performing a dynamic metrology routing adjustment process that includes adjusting the metrology routing based upon a correlation of the tool state analysis to a batch of workpieces which, for at least the reasons cited above, clearly provides a useful, tangible and concrete final result. Therefore, independent claims 1, 13, 26, 38, 44, and 46 each call for a process (metrology routing adjustment process) that is capable of performing a useful, tangible, concrete result, as described above.

Therefore, for at least the reasons cited above, independent claims 1, 13, 38, 44, and 46 are allowable. Additionally, dependent claims 2-8, 14, 27-33, 39-41, 45, and 47-50 which depend from independent claims 1, 13, 26, 38, 44, and 46, respectively, are also allowable for at least the reasons cited above.

The Examiner rejected claims 16-25, 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Pasadyn* in view of *Mih* (US 6,407,396). Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Third, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. *In re*

Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); M.P.E.P. § 2142. Moreover, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); M.P.E.P. § 2143.03.

With respect to the alleged obviousness, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561 (Fed. Cir. 1986). In fact, the absence of a suggestion to combine is dispositive in an obviousness determination. *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573 (Fed. Cir. 1997). The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. The consistent criterion for determining obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the process should be carried out and would have a reasonable likelihood of success viewed in the light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the Appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894 (Fed. Cir. 1988); M.P.E.P. § 2142.

Appellant respectfully asserts that the Examiner did not meet the legal standards to reject the claims of the present invention under 35 U.S.C. § 103(a) because the prior art references (*Pasadyne* and *Mih*) do not teach or suggest all the claim limitations of the claims of the present invention. Additionally, the Examiner has not provided sufficient evidence or arguments that

there is a suggestion that one skilled in the art would have been motivated to combine the references (***Pasady*** and ***Mih***). In fact, Appellant provides arguments that ***Foley*** and ***Mih*** would not have been combined by one skilled in the art. Therefore, the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness under 35 U.S.C. § 103(a) with regarding to claims 1-35 of the present invention.

The combination of ***Pasady*** and ***Mih*** do not disclose or make obvious all of the elements of claims 16-25 and 42-43. For example, claim 17 calls for a controller to perform a dynamic metrology routing adjustment process that includes correlating tool state analysis to a batch of workpieces and adjusting a metrology routing based upon the correlation. ***Pasady*** is directed to a dynamic targeting for a process control system. Perhaps the Examiner's attention was mistakenly caught by the term "dynamic targeting" of ***Pasady***, which may have led the Examiner to cite this art. However, ***Pasady*** is directed to dynamically adjusting a process target setting based upon correlation of electrical data with manufacturing data. ***Pasady*** discloses performing continuous targeting adjustments to process operation performing a dynamic targeting process that includes adjusting a control model, and then monitoring the process operation performed by a system and adjusting the control parameter, affecting the process operation. *See*, column 8, lines 33-41. ***Pasady*** discloses acquiring and analyzing tool state data and performing a dynamic targeting adjustment process or dynamic targeting process, which includes merging/correlating electrical test data with corresponding manufacturing related data and performing a persistent calculation function for adjusting control parameters. *See* column 10, lines 55-63; column 11, lines 39-51.

Mih does not make up for the deficit of *Pasadyn*. *Mih* is directed to acquiring metrology data to measuring characterization of a first feature formed on a semiconductor device, *i.e.*, the critical dimension. *See*, column 5, lines 17-25. *Mih* discloses a waveform signal developed by a metrology system to detect overlay errors in the X and Y directions. The signal represents a center overlay of the alignment target pattern. *See* column 5, lines 26-35. The scans relating to the signals are used to measure critical dimensions, which may be determined by the spacing between peaks of the signals. *Mih* simply does not disclose adjusting the metrology data based upon any type of a correlation. *Mih* simply discloses metrology patterns for measuring critical dimensions of overlay errors in the X direction and the Y direction. *See* column 6, lines 50-60. *Mih* is directed to using the critical dimension measurements to determine whether the dose of focus of the photolithography process is incorrect; and if so, the overlay measurements may be disregarded, which reduces statistical process control noise. *See*, column 7, lines 25-35. There are no portions of *Mih* that disclose or make obvious performing dynamic metrology adjustments based upon correlation of any type of data in *Mih*, which is in direct contravention to the Examiner's assertion regarding the Abstract section in *Mih*.

Firstly, the Examiner simply does not cite to any portion of *Mih* that would support the Examiner's argument that dynamic metrology adjustments, in combination with *Pasadyn*, is disclosed. A mere citation to the Abstract section of *Mih* does not suffice in showing a *prima facie* case of obviousness. Secondly, as described above, *Mih* simply does not disclose any subject matter that would make obvious the dynamic metrology routing adjustment process called for by the claims of the present invention. Simply because the term "dynamic targeting" is disclosed in *Pasadyn* and the term "metrology measurements" is disclosed in *Mih*, does not

mean that their combination makes obvious all of the elements of the dynamic metrology routing adjustment process of claims of the present invention. Therefore, as described above, even if the combination of *Mih* and *Pasady* were to be used, all of the elements of performing the dynamic metrology routing adjustment process is not taught, disclosed, or suggested by *Pasady* and/or *Mih*. Accordingly, the first prong of showing a *prima facie* showing of obviousness is not provided by the Examiner.

Further, the Examiner provides no evidence or arguments as to any motivation to combine *Pasady* and *Mih* that would make obvious all of the elements of claims 16-25, 42-43 of the present invention. *Pasady*, as described above, is directed to performing dynamic targeting relating to the target characteristics of a processed workpiece. In contrast, *Mih* is directed to measuring overlay errors using metrology system. Without using improper hindsight reasoning, those skilled in the art simply would not combine these two references to make obvious the dynamic metrology routing adjustment process called for by claims of the present invention. There is simply no disclosure in the cited prior art as to any type of a dynamic routing adjustment process relating to metrology. The disclosure of the dynamic targeting in combination with the wafer metrology measurements of *Mih*, simply would not provide sufficient motivation to combine the two prior art disclosures to make obvious the subject matter of performing a dynamic metrology routing adjustment process of claims of the present invention.

Further, there is no evidence that combining the two cited art would result in success. Those skilled in the art would not combine *Pasady* and *Mih* without improper hindsight or reasoning and even if they were combined, the reasonable probability of success is negligible

and there is no evidence provided by the Examiner to the contrary. Therefore, neither the second prong nor the third prong of a *prima facie* showing of obviousness is provided by the Examiner. Further, as described above, even if ***Pasady*** and ***Mih*** were to be combined, all of the elements of claims 16-25, 42-43, would still not be taught, disclosed, or suggested since all of the claims 16-25 and 42-43 call for an apparatus that is capable of performing a dynamic metrology routing adjustment process. Therefore, claims 16-25 and 42-43 of the present invention are not made obvious by ***Pasady***, ***Mih***, or their combination. Therefore, 16-25 and 42-43 of the present invention are allowable for at least the reasons cited herein.

Independent claims 16, 17, 22, 26, and 42 call for an apparatus that is capable of performing the dynamic metrology routing adjustment process described above. For at least the reasons cited above, these claims all contain elements that are not made obvious by ***Pasady***, ***Mih***, or their combination. Therefore, independent claims 16, 17, 22, 26, and 42 are allowable for at least the reasons cited above. Further dependent claims 18-21, 23-25, and 43, which depend from claims independent claims 17, 22, and 42, respectively, are also allowable for at least the reasons cited above.

The Examiner indicated that claims 19 and 24 are objected to as being dependent from a rejected base claim, but would be allowable if rewritten in independent form. Applicants respectfully assert that all of the claims of the present invention are allowable.

Reconsideration of the present application is respectfully requested.

In light of the arguments presented above, a Notice of Allowance is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, **the Examiner is requested to call the undersigned attorney** at the Houston, Texas telephone number (713) 934-4069 to discuss the steps necessary for placing the application in condition for allowance.

Respectfully submitted,

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